Project Technical Report CET Java Machines

CSET 1200 Members: Kayla Proffitt, Ethan Freimark, Zack Berry

Instructor: Jared Oluoch, Ph.D. StartDate: 03/12/2018

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**Project Overview**

Ethan Freimark: Ethan created a project GitHub page with multiple user access that allowed for group member file sharing and editing. He also created a project group chat through the application GroupMe to keep group members updated about meeting times, programming issues, ideas, and other various project updates. Ethan provided several files on the GitHub page making updates to the code in progress and created potential classes that helped move the project along. Ethan also applied his knowledge of GUI to make the program human oriented and user friendly. Ethan collaborated with Zack Berry in the making of the PowerPoint.

Zack Berry: Zack is the project leader and responsible for the final written code. He played a large role in the code planning and implementation process. The entirety of the final, working code was created by Zack. Zack was also responsible for getting the group motivated, communicating program information effectively, and working on the PowerPoint with Ethan.

Kayla Proffitt: Author of the technical report. Responsible for collaborating with group members at the end of the project to complete deadlines and gather final report information.

The program implements the flowchart for CET (Construction Engineering Technology) and allows for a student to input the classes that they have already taken out of the flowchart. The program then displays the total credits a student has completed for the CET program, the credit hours they have not yet completed, and the list of classes that remain to be taken from the flowchart with the respective credit hour total that remains to be taken from those classes.

**Programming Approach**

The group approached the project with a whole-team approach. Everyone pitched in on the initial brainstorming process and we openly discussed strengths and weaknesses of each team member within the group. This allowed for the deliverables to be somewhat separated among the group, Ethan and Zack would complete the programming and more technical based tasks, I (Kayla) would complete most of the report writing and information gathering. The project also used a bottom-up approach. Even though we worked as a team throughout the project, much of the work was done separately for each deliverable and all project pieces came together at the end. Time was managed effectively because communication between group members was strong. Throughout the project, group members kept each other informed, asked each other questions, and worked together to make the program and report process as lean, organized, and efficient as possible.

**The Program Itself**

The program consists of multiple methods, one main method that holds the variables and utilizes multiple imports to calculate the initial credits the student started with and credits remaining for the student. The main method imports scanner method, which prompts the student to enter the amount of credit hours they have taken in the CET flowchart, and the courses that the student has completed in the CET flowchart. The beginning of the program contains an inputCredits variable (a variable that created for the credits taken set = 0), a creditsFinished variable (a variable for the credits taken after adding up what the student has set = 0), and a totalCredits variable (a variable for all the credits set = 128). A string input is also utilized along with an array called tokens which creates a list for all the classes taken. A while loop with Boolean true is implemented for inputting the class names. The while loop contains an if statement that creates a break point in the list depending on what the student has entered as being completed. This is possible because the student is prompted to enter the variable q after the courses that have been completed is entered. A variable called tokens is created that eliminates spaces in the class name and number. A variable called key assigns the array tokens as [0]and [1] to correctly format the name and number of the course given. An if statement follows these which checks if the class entered is a class inside of the list of classes available in the flowchart, takes the sum of the credits taken, and removes a class from the list if the class has been taken. This if statement calls on another class called the CETclass which holds a method that contains the parameters (String dept, String courseNum, String name). Each parameter is assigned as a variable with the keyword “this.” because the method does not return a value. The program then prints the “Finished Credits” from the variable creditsFinished, and lets the student know that “You must complete the following courses”. The credits remaining and the class remaining that were provided in the key are printed out through calling the CETdegree method.

**Lessons Learned**

The concepts learned in class helped with the basic java concepts in the project. The class helped to build a strong core foundation about many of the frequently used concepts in java. These concepts include creating if statements, for loops, while loops, utilizing and understanding methods, single and multi-dimensional arrays and utilizing the concept of multiple classes to organize and break up longer codes. Another very important concept learned was the use of the Scanner method which was a large part in most of the programs we wrote in class and out.

Some of the programming skills that were strengthened during the project were the utilization of multiple imports like the HashMap, Iterator, and the Map to make the program run more smoothly. The project strengthened programming capability in creating methods to reduce redundancy and implemented more variables then we have had had to work with in the past. The project also strengthened our ability to find information using the java text book and other resources such as google to find more efficient ways of writing the program instead of just looking at the PowerPoints and the lecture notes made available on blackboard.

Overall, I think the course and the project helped all the group members acquire basic programming skills in java. The project took the basic concepts covered in class to a deeper, more technical level of understanding where we were able to see the many possibilities that java offers as a programming language.